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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/594,665	09/28/2006	Morimitsu Nakamura	427-113	2206

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EXAMINER	
HOPKINS, ROBERT A	

ART UNIT	PAPER NUMBER
1797	

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10/30/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/594,665	NAKAMURA ET AL.	
	Examiner	Art Unit	
	Robert A. Hopkins	1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 August 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Kalbassi et al(5855650).

Kalbassi et al teaches a method for restarting a temperature swing adsorption apparatus which purifies feed air for a cryogenic air separation plant comprising in the case where the TSA apparatus is stopped when or after when a temperature of a purge gas which flows out from a first adsorption column (20) during a regeneration process became a peak temperature in the regeneration process, in the first adsorption column during the regeneration process, closing, at the time of stopping the TSA apparatus, an entrance valve, an exit valve, and an atmosphere releasing valve(see figure 1 for the claimed valves), in a second adsorption column(22) during an adsorption process, closing an entrance valve and an exit valve and opening an atmosphere releasing valve so as to release a gas in the opposite direction to feed air flow, followed by closing the atmosphere releasing valve, pressurizing , just before a restart , the second adsorption column with the feed air to a pressure necessary for the adsorption process(column 6 lines 59-67, column 7 lines 1-14), performing , after the restart , the regeneration process in the first adsorption column and the adsorption process in the second

adsorption column continuously from the time point of stopping the TSA apparatus. Kalbassi et al further teaches wherein the feed air which is fed to the TSA apparatus has a temperature of 5-45 C and a pressure of 400 to 1000 kPA(Table 1).

Claims 3-5 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Kalbassi et al(5855650).

Kalbassi et al teaches a method for restarting a temperature swing adsorption apparatus which purifies feed air for a cryogenic air separation plant comprising in the case where an elapsed time t1 of a regeneration process at the time point of stopping the TSA apparatus satisfies the claimed formula in the first adsorption column during the regeneration process, in the first adsorption column during the regeneration process, closing, at the time of stopping the TSA apparatus, an entrance valve, an exit valve, and an atmosphere releasing valve(see figure 1 for the claimed valves), in a second adsorption column(22) during an adsorption process, closing an entrance valve and an exit valve and opening an atmosphere releasing valve so as to release a gas in the opposite direction to feed air flow, followed by closing the atmosphere releasing valve, pressurizing , just before a restart , the second adsorption column with the feed air to a pressure necessary for the adsorption process(column 6 lines 59-67, column 7 lines 1-14), performing , after the restart , the regeneration process in the first adsorption column and the adsorption process in the second adsorption column from the beginning of each process while blocking purified air flow from the TSA apparatus to an air separation section(not shown, and starting to feed purified air to the air separation section. Kalbassi et al further teaches wherein the adsorption process is performed

with the flow rate of feed air corresponding to the flow rate of purge gas necessary for the regeneration process of the adsorption column after the restart before starting to feed the purified air to the air separation section. Kalbassi et al further teaches wherein the feed air which is fed to the TSA apparatus has a temperature of 5-45 C and a pressure of 400 to 1000 kPA(Table 1).

Claims 6 and 7 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Kalbassi et al(5855650).

Kalbassi et al teaches a method for restarting a temperature swing adsorption apparatus which purifies feed air for a cryogenic air separation plant comprising in the first adsorption column during the regeneration process, closing, at the time of stopping the TSA apparatus, an entrance valve, an exit valve, and an atmosphere releasing valve(see figure 1 for the claimed valves), in a second adsorption column(22) during an adsorption process, closing an entrance valve and an exit valve and opening an atmosphere releasing valve so as to release a gas in the opposite direction to feed air flow, followed by closing the atmosphere releasing valve, pressurizing , just before a restart , the second adsorption column with the feed air to a pressure necessary for the adsorption process(column 6 lines 59-67, column 7 lines 1-14), performing , after the restart , the regeneration process in the first adsorption column and the adsorption process in the second adsorption column from the time point of stopping the TSA apparatus and then switching the processes to perform the adsorption process in the first adsorption column and the regeneration process in the second adsorption column once while blocking purified air flow from the TSA apparatus to an air separation

section, and starting to feed purified air to the air separation section. Kalbassi et al further teaches wherein the adsorption process is performed with the flow rate of feed air corresponding to the flow rate of purge gas necessary for the regeneration process of the adsorption column after the restart before starting to feed the purified air to the air separation section. . Kalbassi et al further teaches wherein the adsorption process is performed with the flow rate of feed air corresponding to the flow rate of purge gas necessary for the regeneration process of the adsorption column after the restart before starting to feed the purified air to the air separation section.

Claims 8 and 9 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Kalbassi et al(5855650).

Kalbassi et al teaches a method for restarting a temperature swing adsorption apparatus which purifies feed air for a cryogenic air separation plant comprising distinguishing the time point of stopping the TSA apparatus in a case in which the TSA apparatus was stopped when or after when a temperature of a purge gas which flows out from a first adsorption column during a regeneration process became a peak temperature in the regeneration process;

in the second case where an elapsed time t1 of a regeneration process at the time point of stopping the TSA apparatus satisfies the claimed formula in the first adsorption column during the regeneration process, in the first adsorption column during the regeneration process, closing, at the time of stopping the TSA apparatus, an entrance valve, an exit valve, and an atmosphere releasing valve(see figure 1 for the claimed valves), in a second adsorption column(22) during an adsorption process,

closing an entrance valve and an exit valve and opening an atmosphere releasing valve so as to release a gas in the opposite direction to feed air flow, followed by closing the atmosphere releasing valve, pressurizing , just before a restart , the second adsorption column with the feed air to a pressure necessary for the adsorption process(column 6 lines 59-67, column 7 lines 1-14), performing , after the restart , the regeneration process in the first adsorption column and the adsorption process in the second adsorption column from the beginning of each process while blocking purified air flow from the TSA apparatus to an air separation section(not shown), and starting to feed purified air to the air separation section;

and in the third case in the first adsorption column during the regeneration process , closing, at the time of stopping the TSA apparatus, the entrance valve, exit valve, and atmosphere releasing valve, in a second adsorption column(22) during an adsorption process, closing an entrance valve and an exit valve and opening an atmosphere releasing valve so as to release a gas in the opposite direction to feed air flow, followed by closing the atmosphere releasing valve, pressurizing , just before a restart , the second adsorption column with the feed air to a pressure necessary for the adsorption process(column 6 lines 59-67, column 7 lines 1-14), performing , after the restart , the regeneration process in the first adsorption column and the adsorption process in the second adsorption column from the time point of stopping the TSA apparatus and then switching the processes to perform the adsorption process in the first adsorption column and the regeneration process in the second adsorption column

once while blocking purified air flow from the TSA apparatus to an air separation section, and starting to feed purified air to the air separation section

Kalbassi et al further teaches wherein the adsorption process is performed with the flow rate of feed air corresponding to the flow rate of purge gas necessary for the regeneration process of the adsorption column after the restart before starting to feed the purified air to the air separation section.

Response to Arguments

Applicant's arguments filed 8-31-09 have been fully considered but they are not persuasive.

Applicant argues that in the restart method of the present invention, the time point of stopping the TSA apparatus is separated into the 3 cases i),ii), and iii), and the appropriate sealing process and restart process of the TSA apparatus are performed in each of those 3 cases (see claims 1,3,6, and 8 of the present specification).

Examiner respectfully submits that a sealing and restart process is not positively claimed in claims 1,3,6, and 8, therefore statements that Kalbassi et al does not teach a sealing and restart process is not given patentable weight.

Applicant argues Kalbassi et al disclose a transitional process from the regeneration process to the adsorption process is performed during the continuous operation. Applicant argues Kalbassi et al does not disclose the sealing and restart process, which are performed during the long term stop of the TSA apparatus.

Examiner respectfully submits that a sealing and restart process is not positively claimed in claims 1,3,6, and 8, therefore statements that Kalbassi et al does not teach a sealing and restart process is not given patentable weight.

Examiner respectfully submits Kalbassi et al clearly teaches a TSA apparatus in which one adsorption column is thermally regenerated while a second adsorption column is provided with feed air for adsorption. Examiner also notes that the valve structure in figure 1 of Kalbassi et al is identical to the valve structure of Figure 1 of the current application, wherein a bypass section(64) in figure 1 of Kalbassi et al passes a regenerating gas around a heater(62). In the current specification on page 21 is recited "Since the adsorption column 5b which performed the adsorption process has been pressurized again by the inflow of the feed air after the restart of the TSA apparatus, the effect of the temperature reduction due to the outflow of the gas is cancelled, while the effect of the temperature reduction due to the desorption of the impurities and heat transfer remains. Therefore, in the adsorption column 5b, the adsorption process is started at a lower temperature than at the time point of stopping the TSA apparatus". Examiner notes Kalbassi et al teaches a smiliar desorption process with a reduced temperature as noted in column 4 lines 7-10 , wherein Kalbassi et al teaches "We have found that by suitable adjustment of the conditions it is possible to achieve regeneration so as to allow repeated cycles of adsorption and regeneration with only a fraction of the heat of desorption being supplied by heating the regenerating gas". Examiner notes that regeneration using only a fraction of the heat of adsorption can only be achieved by closing a heating section(using valve 58 in Kalbassi et al). An identical setup an

operation is performed by closing valve 12 in figure 1 of the current drawings. Therefore, Examiner respectfully submits that Kalbassi et al clearly teaches determining a peak temperature of a purge gas, and regenerating an adsorption column using a gas heated to a temperature at or below the determined peak temperature(noting column 4 lines 50-54 of Kalbassi et al stating "The quantity of heat added to the regeneration gas is preferably no more that 80% of the heat of the heat of adsorption liberated during the adsorption of the gas component".

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert A. Hopkins whose telephone number is 571-272-1159. The examiner can normally be reached on Monday-Thursday, 7:30am-5pm, every Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duane Smith can be reached on 571-272-1166. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Rah
October 28, 2009

/Robert A Hopkins/
Primary Examiner, Art Unit 1797